PREPRODUCTION INITIATIVE-NELP
POWDER COATING TOUCH-UP KIT
TEST PLAN

SITE: NAS NORTH ISLAND

1.0 OBJECTIVE

The Navy is currently transitioning from liquid paint to powder paint for mines and support equipment. Although powder paint is preferable to liquid paint because of its low VOC content and high durability, using powder paint for small touch-up work has been less efficient than liquid paint touch-up procedures, which require only a can and a paintbrush. Because powder paint is usually applied in large automated or manual processes, minor touch-up repairs have required the entire piece of equipment to be stripped and recoated. The purpose of the powder coating touch-up kit technology demonstration is to refinish only the damaged portion of the substrate's coating system on-site—thereby eliminating unnecessary depainting and repainting and the need to transport the equipment to the repair facility.

This test plan describes the data collection procedures for the powder coating touch-up kit. The data will be used to determine the kit's efficiency, effectiveness, and overall success in repairing small scratches and minor coating damage. The kit is expected to:

- improve corrosion resistance
- simplify the coating repair process
- minimize coating waste and dusts
- provide a healthier work environment
- increase the use of powder coating systems.

2.0 EQUIPMENT DESCRIPTION

NAS North Island currently sends scratched or damaged equipment offsite to be repainted. The need to transport the equipment to a repair facility results in equipment downtime and waste disposal costs for the unnecessary paint waste. By eliminating the need to repaint the entire piece of equipment, the site will save time and reduce costs due to improved efficiency, fewer required man-hours, less waste for disposal, and reduced equipment downtime.

The powder coating touch-up kit includes equipment for surface preparation, paint application, and heat curing. The Nilfisk Double Action Sanding System chosen for surface preparation is a vacuum-assisted sanding system that reduces the amount of paint dust released to the environment. The Nordson Manual Powder Outfit chose for paint application consists of a dolly-mounted, 50-pound hopper; a manual spray gun; and a power controller. To increase ease-of-use and paint usage efficiency, the manual spray gun has an automatic feedback current (AFC) control, which adjusts the electrostatic

voltage output to maintain the optimal powder charge and external field strength regardless of the distance between the gun and the substrate. The BGK AutoCure Infrared Heater chosen for heat curing is a portable infrared heater than can automatically adjust the surface temperature and has a multipositioning head with a counterbalanced arm that can easily reach all surfaces. A paint meter has been included with the prototype unit to collect data when testing the technology and to assist the operator in making decisions/adjustments according to/given the uncertainty associated with outdoor paint application.

3.0 TEST PLAN

This test plan will evaluate the effectiveness of the powder coating touch-up kit in reducing costs, time and waste volume.

3.1 Approach

Quantitative and qualitative data will be acquired through the completion of Tables 1a, 1b, 2a, 2b, and 2c.

3.1.1 Instructions for Completing the Tables

- **Operational Data – Table 1a**

  - **Date:** Indicate the date the touch-up kit was used.

  - **Equipment ID:** Indicate the identification number of the equipment being repaired or provide a brief description of the equipment.

  - **Meter Readings:** Record the following data as indicated by the metering kit: surface profile, humidity and dewpoint, steel and substrate temperature, wet paint thickness; and dry film thickness.

  - **Type of Paint:** Indicate the type of paint applied to the substrate (e.g., TGIC, urethane, polyester).

  - **Area Covered:** Indicate the square footage of the equipment surface being repaired.

  - **Time/Task:** Record the number of man-hours spent repairing the substrate.

- **Waste Disposal Data – Table 1b**

  - **Waste Disposal Date:** Indicate the date that hazardous material was disposed of.

- **Waste Volume:** Indicate the volume of hazardous waste disposed of. (Provide this information only when waste is actually disposed of; touch-up work may or may not have occurred on the same date.)

- **Consumables – Table 2a**

  - **Date:** Indicate the date consumables were ordered.

  - **Item:** Record the specific consumables being replaced (*e.g.*, air tool oil, pads, vacuum filters, paint, etc.). If available, provide the part number and description.

  - **Quantity:** Record the amount of each consumable being replaced.

  - **Cost:** Record the cost of each consumable being replaced.

- **Downtime – Table 2b**

  - **Time Period:** Record any periods greater than one week when the kit was not used.

  - **Reason:** Explain whether the downtime was due to repairs, maintenance, workload or other factors.

- **Repairs – Table 2c**

  - **Time:** Indicate the time required to repair the touch-up kit.

  - **Parts:** List the repair parts required for repair.

  - **Cost:** Indicate the cost of the parts required for repair.

- **Qualitative Assessment:** Provide a narrative evaluation of the kit's capabilities. Briefly discuss the following:

  - any damage to the substrate that resulted from surface preparation, paint application, or heat curing

  - the efficiency and cost-effectiveness of the kit

  - the kit's ease-of-use and its ability to successfully interface with site operations.

4.0 REPORTING

The data entry forms are a concise method of data collection. Forms should be completed on a daily basis; data will be collected for one year. During this time, periodic status reports on the testing should be submitted via fax. The final report will include detailed results and observations, assess the efficiency and cost-effectiveness of the unit, and evaluate its ability to interface with site operations.

TABLE 1A
OPERATIONAL DATA

Date	Equipment ID	Meter Readings					Area
		Surface Profile	Humidity & Dew Point	Steel & Substrate Temp.	Wet Paint Thickness	Dry Film Thickness	

TABLE 1B
WASTE DISPOSAL DATA

Waste Disposal Date	Waste Volume

TABLE 2A CONSUMABLES			
Description	Item		Quantity
	Number	Description	

TABLE 2b DOWNTIME	
Time Period	Reason

TABLE 2C REPAIRS		
Time	Parts	

Qualitative Assessment (attach additional sheet if needed): Please comment on the effectiveness and efficiency

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